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Low Energy Electronic Structure of $Ce_{1-x}La_xSb$ (x = 0, 0.1) in the Magnetically Ordered States

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In order to investigate the electronic structures in the magnetically ordered states and the origin of the magnetic transition of $Ce_{1-x}La_xSb$ (x = 0, 0.1), we measured the optical reflectivity and the magnetic circular/linear dichroism of the reflectivity spectrum in the infrared region at low temperatures down to 4 K under magnetic fields up to 14 T. The optical conductivity ($\sigma(\omega)$) spectrum derived from the reflectivity spectrum strongly varies with the change of the temperature and the magnetic field due to the magnetic phase transition. The $\sigma(\omega)$ spectrum reflects the electronic structure near the Fermi level, mainly the Sb $5p$ band and the Ce $5d$ band. The $\sigma(\omega)$ spectra in the ordered states cannot be explained only by the energy band folding due to the appearance of the ling periodic magnetic structure. In addition, the $\sigma(\omega)$ spectra cannot be explained only by using the pf mixing model. To explain the $\sigma(\omega)$ spectra, not only the pf mixing but also the mixing of the Sb $5p$ and the Ce $5d$ states after the pf mixing is important.